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Classification of races, divisions, and relationships.
Prehistoric Anthropology. G. de Mortillet.
(1.) Human palæontology.
(2.) Prehistoric archæology.
(3.) Determination of human remains by archæological data.
Linguistic Anthropology. M. Hovelacque.
General characteristics, classification, and division of languages.

In *Archivio per l'Antropologia*, etc., Dr. Luigi Pagliani publishes an interesting memoir upon the influence of human environment upon the development of the individual, taking as his motto Quetelet's sentence, "The development of the mature man is trammeled by the special conditions in which the poor infants find themselves; the laws of nature are combated by the influences of our social organization without recurring to force. It depends in some sort upon the government to have the people large or small, more or less vigorous." M. Pagliani treats of his subject under the four following heads: —

(1.) The influence of unfavorable conditions of life on the physical development of men.

(2.) Influence of the amelioration of life upon organisms at first subjected to unfortunate conditions.

(3.) Influence of conditions somewhat favorable to life upon human physical development.

(4.) Relation between the physical development of the male and the female sex under diverse conditions.

(5.) Activity of physical development in the years which precede and follow the age of puberty in the two sexes, and under special conditions.

Five parts of Mr. Herbert Spencer's Descriptive Sociology are now in print, namely: (1.) English, (2.) Ancient American Races, (3.) Lowest Races, Negritos, Polynesians, (4.) African Races, (5.) Asiatic Races. Volume I. of The Principles of Sociology is also announced by the same author. — OTIS T. MASON.

NOTE. In order to make the monthly anthropological notes, kindly prepared for the Naturalist by Professor Mason, as complete as possible, authors of books, pamphlets, or newspaper articles relating to anthropology, published either in this country or Europe, are invited to send copies to Prof. O. T. Mason, Columbian College, Washington, D. C. —EDITOR AMERICAN NATURALIST.

GEOLOGY AND PALÆONTOLOGY.

MM. GAUDRY AND DE SAPORTA ON THE PALÆONTOLOGY OF THE WESTERN TERRITORIES.[1] — I have readwith much interest the explanations in your letter relating to the explorations of the western Territories. I see that the works of Mr. Lesquereux on vegetable palæontology appear to you to be of great importance. As to myself I eagerly pursue the researches made in regard to fossil vertebrates. I think like yourself that the results of the explorations directed by Professor Hay-

[1] In a letter to Count de Saporta.

den are to be counted among the most remarkable acquisitions of modern palæontology; naturalists are compelled to recognize gratefully the labors of that great explorer who has gathered so many new facts, and who has so well understood the art of selecting such able assistants. From my stand-point, it is not the discovery of strange and hitherto unknown forms which produces the highest interest in Dr. Leidy's works on mammiferous fossils, but the discovery of the neighboring forms of our European mammiferous fossils, for they show us the ties between the species of the Old and the New World; also they let us hope that we may be able to understand and discover more easily the connections of the beings of the geological ages.

Dicotyles arcuatus looks very much like *Chœromorus* of the middle Miocene of Sausan; *Hyopsodus* has molars like the *Hyœgulus* of the superior Eocene of Débruge; *Microsyops* is related to the *Adapis*, a genus partly lemurian, partly pachydermatous, which under the name of *Adapis*, sometimes under that of *Paleocolemus* and also of *Aphelotreium*, has left numerous débris in the superior Eocene, and in the lowest Miocene. *Merychippus* looks much like *Protohippus*, and the latter itself seems to be a *Hipparion* of the Leberon, the island of the superior molars of which has been transformed into a peninsula. *Archæotherium* is nothing else than the *Entelodon* of our inferior Miocene of Bouzon. Concerning dentition, *Paleosyops*, *Limnohyus*, and *Titanotherium* resemble a good deal the *Chalicotherium*; this similitude of forms has struck me the more, as it shows itself in the species, alike common in America and Europe; the *Chalicotherium* is found in Europe in the inferior Miocene of phosphorites, the middle Miocene of Sausan, and the superior Miocene of Eppelsheim. *Hyrachius* presents us a rare example of the passage from the *Lophiodon* to the tapir; concerning the distinctive marks of the latter there appears a last superior pre-molar which is simplified, and provided with one single internal denticule, like the *Lophiodon*. According to my judgment, the animal lately discovered by M. Filhol in the phosphorites of Querez, under the name of *Tapirus priscus*, is a genuine *Hyrachius*. The *Hyracodon* is one more link between the *Rhinoceros* and the *Paleotherium*; it is the former which has the dental formula of the *Paleotherium*. The *Œlurogale* of the phosphorites described by M. Filhol is the immediate ally of Dr. Leidy's *Dinictis*. There are found other examples of intermediate forms in the publications of the American savants. If we add, to judge from the plates of Dr. Leidy, the discoveries in the western Territories of the *Amphicyon*, *Canis*, *Pseudœlurus*, *Mœhœcodus*, *Hyænodon*, *Hipparion*, *Anchitherium*, *Rhinoceros*, *Hyopotamus*, *Mastodon*, very closely related to the species we find in France, it becomes singularly probable that the west of North America and Europe have been in connection during the Miocene period. How could such a thing have happened, if, as able geologists believe, the Atlantic Ocean has scarcely changed its place?

Did the communication take place on the side of the Pacific? There are many mysteries still to be solved. The fine researches of American savants open new horizons for our thoughts; being so distant they still appear a little misty, but doubtless they will come forward one day and inaugurate the great era of palæontology.

Will you please, dear friend, accept the expression of my most sincere sentiments. — ALBERT GAUDRY, Professor of Palæontology in the Museum of Natural History.

Professor Hayden: Dear and Honored Sir, — For many months I have lived in communication of thought with you, and the happy intermedium of our common friend, Lesquereux, binds us to each other. Your name now is so widely known in Europe, and it is so intimately connected with the splendid discoveries which palæontologists owe to your explorations, that I have double pleasure in writing to you. We watch attentively the results of your undertaking, and, for myself, I may say that the rich harvest of Cretaceous and Tertiary fossil plants gathered under your direction have opened before me such broad horizons, that I am never tired of considering them. I have successively received the publications, reports, and fine maps recently published, — thanks to your perseverance. I offer you my most sincere wishes for the continuation of your work.

The richness of your deposits is incalculable, but it does not surprise me, and I believe that you will be able greatly to increase your treasure by new researches. Here in Europe, upon a cut-up continent which for a long time has rather been an archipelago than a wide region, we have small lacustrine formations, corresponding with other lakes of small extent, also, and these formations are often very rich in fossils. But this abundance is restricted, though real, for the extent of the formation is proportional to that of the land surface wherein they are distributed. But in America all is on a very large scale: the rivers, the plains, the lakes, the mountains, the frame itself is grand; and this aspect is the result of ancient causes which have influenced the nature and the thickness and extent of the formations.

You will therefore discover in these deposits (ours are unimportant in comparison to them) an inexhaustible mine of fossil wonders, and be able to rebuild in its integrity the transition age, from the Cretaceous to the Tertiary, a serial link destroyed in Europe by a succession of blanks.

Nevertheless in Provence even, and quite near Aix, we have a small agglomeration of what is known under the name of Lignitic of Felveau, which my friend Matheron has determined as the equivalent of the freshwater upper Cretaceous formation (Santonienne) which passes by degrees in its upper part to strata incontestably of Tertiary age. Regretfully, however, these intermediate layers which would be most interesting to know well are very barren of fossils, while the lignitic themselves have a lacustrine fluviatile fauna, and also brackish deposits extremely rich in fossils. At a much higher level we have the gypsum of Aix, which you probably know by name at least.

I beg you will accept my highest regard and sincere devotedness. — Count Gaston de Saporta, Aix in Provence.

MICROSCOPY.[1]

Microscopical Structure of Amber. — A paper on this subject, contributed jointly by H. C. Sorby and P. J. Butler, to the Royal Microscopical Society, furnishes many interesting observations and reflections. Scattered irregularly through the masses of amber are a vast number of minute cavities, usually $\frac{1}{2000}$ to $\frac{1}{30000}$ of an inch in diameter, though some are as large as $\frac{1}{1000}$, and others probably as small as $\frac{1}{100000}$ of an inch. Though very numerous in the clouded portions of the amber, these cavities are nearly wanting in the very transparent specimens, and therefore cannot be considered a necessary result of the changes which occurred during the hardening of the balsam or resin from which the amber must have been formed. They are usually round, the shape which would be naturally assumed by drops of water or bubbles of air confined in a stiff liquid, differing in this respect from the cavities in crystals which are often spaces left vacant during the formation of the crystal, and are bounded by crystalline planes having direct relation to the form and structure of the crystal itself. The cavities in amber, however, are sometimes elongated or otherwise changed by internal movements in the resinous mass before it became hard and brittle. Some of these cavities are filled with a liquid, probably water, which differs so slightly from the amber in refractive power, that these cavities are transparent throughout a large portion of their area, the circumference being marked by a narrow, dark line. Other cavities contain gas, constituting true air bubbles, whose dark outline constitutes at least one third of their diameter, leaving a comparatively small bright spot in the centre. Still other cavities contain liquid with an inclosed air bubble; while some of the fluid cavities only seem to contain one or more air bubbles from the appearance through them of images of one or more smaller cavities beneath. Most of the cavities originally contained water, which was eliminated during the process of change from a soft balsam to a hard resin, but subsequently the water escaped from many of the cavities leaving air cavities instead, which are not only especially abundant near the natural surface of pieces of amber, but may also be found very generally close to the surfaces of sections which have been prepared and mounted for microscopical use. A comparatively rare form of cavity, and characteristic of amber, is balloon shaped, the portion representing the car being nearly always filled with water and the upper part of the balloon with air. This may have been originally a round fluid cavity, from which the gas was allowed to escape into the still plastic, surrounding

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[1] Conducted by Dr. R. H. Ward, Troy, N. Y.